

REMARKS

It appears that the examiner is relying on the same prior art documents and arguments that were relied upon in the previous Office Action.

Applicants believe that as essential starting point is to have the Examiner recognize that the presence of the rheological grade sepiolite in the claimed compositions of Applicants' invention is neither the same as nor obvious over the conventional sepiolite in the compositions disclosed in the cited prior art references. The examiner has expressed the wish for the Applicants to explain the differences between conventional and rheological grade sepiolite.

Applicants request that the Examiner direct his attention to the fact that the instant specification (cf. page 4, line 2; page 5, line 3) clearly explains what rheological grade sepiolite is, where it is described (e.g. in EP-A-0454222 AND EP-A-0170299), and that it is commercially available under the tradename PANGEL. For your further information, forwarded herewith is a copy of EP-0170299, in which the properties of rheological grade sepiolite are described in detail.

Examples 2 - 3 of the instant specification further show that the addition of additives of the present invention comprising rheological grade sepiolite, provide at least the same properties as the conventional additive comprised of cellulose derivatives, but at a substantially lower cost.

It would not have been obvious to the skilled artisan to use rheological grade sepiolite in replacement of conventional sepiolite, for the reasons set forth below.

Additives for construction material mixtures, tile glues and gypsum putties comprising a mineral clay which can be conventional sepiolite, a starch ether and a natural modified gum (e.g. guar gum) are described for example in EP-

0773198, which is also discussed as prior art in the present application (cf. page 2, lines 9-25). EP-0773198 discloses the following with regard to prior art and the goals to be achieved to overcome disadvantages of prior art:

Page 2, lines 5-22: *Thin-layer glue mortars and gypsum putties comprise agglomerates and fillers as their main components. The most usual agglomerates are gypsum and cement whilst the fillers are mainly composed of raw materials that contain quartz and/or carbonates. Further important components are additives, which are added, in small amounts to improve the workability thereof and thereby comply with important functions. Addition of cellulose ethers modifies the workability of such construction material mixes. The thickening effect (consistency) and the water-retaining capacity are increased, adherence to the base becomes significantly improved. So as to improve the standing capacity, the cellulose ethers are further modified with additional thickeners. The most important modifying agents are polyacrylamides, the use of which is described for example in DE-A-1283726 and US-A-4021257. Whilst cellulose ethers improve adherence, addition of polyacrylamides partially compensates this effect.*

Cellulose ethers provide a thickening effect i.e. they increase the consistency of water-containing preparations. However, when subject to shearing forces, as for example when in the case of tile glues the tiles are inserted by pushing, the consistency decreases such that the tiles slide down. By adding polyacrylamides the consistency-increasing effect of the cellulose ether is significantly increased and the consistency decrease under shearing forces is greatly reduced, so that the tile do not slide down. Another important advantage of polyacrylamides is their very fast formation of consistency that depending on the polyacrylamide used, is complete in less than 30 seconds. Disadvantageous late-thickening properties are not being observed in the case of polyacrylamides. On the grounds of the very complex way of action of polyacrylamides, replacement of these products is extremely difficult.

Page 2, lines 30-33: *It was the task of the present invention to provide a thickening system that may work without polyacrylamides, and that shows a fast building-up of consistency and the least possible late thickening.*

It has been surprisingly found that the object as posed in being complied with, by means of a polyacrylamide-free combination of cellulose ethers, starch ethers and layered silicates.

EP-0773198 thus refers to an additive comprising a series of ingredients including sepiolite and attapulgite, as well as at least a cellulose ether i.e. a cellulose derivative. From the above the skilled artisan would infer that cellulose derivatives such as cellulose ethers are unavoidable components which must always be present in additives for special mortars and gypsum, so as to ensure sufficient thickening and suitable adherence.

Please notice that Claim 1 of the present application differs from the disclosure of EP-0773198 and from any of the other prior art documents cited by the examiner, in that it does not comprise any cellulose derivative but a rheological grade sepiolite.

By way of further explanation, the problem inherent in additives containing cellulose derivatives for which EP-0773198 is representative, is that cellulose derivatives are rather expensive for use in additives for gypsum, mortars etc. As stated in page 3, lines 1-8, it is one object of the present invention to overcome the drawbacks (i.e. the rather high price) of conventional gypsum and mortar comprising cellulose derivatives, by introducing a new additive having qualities that are at least similar to additives containing cellulose additives but that allow for reduction of the final costs of special mortar and gypsum compositions. Whilst EP-0773198 cites, *inter alia*, sepiolite and attapulgite as useful components in the therein disclosed additives, it is silent in respect of any teaching or suggestion in respect of how the use of cellulose derivatives could be avoided and, in fact, EP-0773198 is even absolutely silent in respect of the said problem i.e. the rather high price of cellulose derivatives.

There is thus no teaching or suggestion in any of the prior art references cited by the examiner, which would have guided the skilled person to replace cellulose derivatives (by a rheological sepiolite as defined in claim 1 of the present application, with the expectation of at least similar workability and final properties in special mortar and gypsum), with those including additives with conventional additives containing cellulose derivatives, and which replacement would result in a substantially less expensive composition compared to conventional additives.

Additionally, in view of the straightforward teachings in EP-0773198 according to which cellulose derivatives are a necessary component in additives for construction materials, the skilled person knowing of the existence and higher cost of rheological grade sepiolites would have refrained even from considering or trying to use rheological grade sepiolite instead of conventional sepiolite, insofar as such a replacement would have rendered the additive still more expensive as such an additive would have contained two expensive components i.e. the cellulose derivative and the rheological grade sepiolite.

Applicants strongly content that owing to the foregoing excellent properties and lower cost, the instantly claimed additive, apart from being novel and unobvious, is also unexpectedly advantageous and certainly amounts to patentable subject matter over prior art. There is no teaching or disclosure in any of the prior art documents relied on by the examiner, that the therein-described sepiolites are rheological grade sepiolites rather than conventional sepiolites. To enumerate with specificity:

- **Patel** et al. teach only that the *clay useful in the invention can be any clay* and that *examples of suitable clays are ... sepiolite* (cf. col. 3, lines 28-31).
- **Chaux** et al. teach only that *exemplary of the argillas suitable for use are ... (v) attapulgite and sepiolite* (cf. col. 7, lines 18-28).

- **Ricci** et al. teach only that their composition may comprise a *clay which includes ... sepiolite* (cf. col. 4, lines 9-24).
- **Keilhofer** et al. only teach solids compositions in which the *main component is a clay mineral which preferably consists of ... sepiolite ...*, or *of synthetic clays* (cf. col. 2, lines 28 - 32).
- **Cowan** et al. only teach *powdered clays such as ... sepiolite* (cf. col. 8, lines 46-47).
- **Carpenter** et al. only teach that *the hydrous magnesium silicate clay ... with sepiolite being preferred* (cf. col. 5, lines 26-28).
- **Carter** only teaches that *suitable clays include ... sepiolite* (cf. col. 3, lines 60-65).
- FR 1505541 only teaches a *viscosity conditioning agent ... selected from among ... clays ... such as sepiolite* (cf. page 1, left column, lines 5-8).

The Examiner contends that *there appears to be no difference between conventional sepiolite and rheological grade sepiolite*. This is not correct in view of what is being disclosed in the instant specification, which recites that the solid mineral component is

... rheological grade sepiolite such as the one described for example in European patent applications EP-A-0454222 and EP-A-0170299, whose content is included in the present description by reference.

Rheological grade sepiolite, marketed for example by TOLSA, S.A., Madrid, Spain, under the trade mark PANGEL, and obtained from natural sepiolite by means of special micronization processes that substantially prevent breakage of the sepiolite fibers, disperses

easily in water and other polar liquids, and has an external surface with a high degree of irregularity, a high specific surface, greater than 300 m²/g and a high density of active centers for adsorption, that provide it a very high water retaining capacity upon being capable of forming, with relative ease, hydrogen bridges with said active centers. The microfibrous nature of the rheological grade sepiolite particles makes sepiolite a material with high porosity and low apparent density. Due to the above mentioned properties, rheological grade sepiolite is capable of forming high viscosity pastes with excellent thixotropic and pseudoplastic behavior. In accordance with the invention, it has been verified that, when rheological grade sepiolite is added, along with a modified natural gum, to conglomerate building materials such as special mortar and gypsum, the adhesiveness, cohesion, surface efficiency, stability and texture of the mortar and gypsum are improved.

Additionally, rheological grade sepiolite has a very low cationic exchange capacity and the interaction with electrolytes is very weak, which in turn causes rheological grade sepiolite not to be practically affected by the presence of salts in the medium in which it is found, and therefore, it remains stable in a broad pH range. This final characteristic proves to be of the utmost importance since the mediums in which they work have a high salt content.

The prior art documents relied on by the examiner refer only to "sepiolite" and are silent in respect of any other terms which might be indicative of that the "sepiolite" were not natural i.e. conventional sepiolite clay. Therefore, the skilled person would not have had any reason to consider that the prior art references relied on by the examiner would refer rather to rheological grade sepiolite rather than to conventional sepiolite clay.

Applicants believe the foregoing AMENDMENT and RESPONSE to be completely responsive to the rejections made and accordingly pray for early allowance.

CONCLUSION

The fee for a three month extension of time is enclosed herewith. No other fees are believed to be necessitated by the foregoing Response. However, should this be erroneous, authorization is hereby given to charge Deposit Account No. 11-1153 for any underpayment, or credit any overages.

Respectfully submitted,

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